Notice of Allowability	Application No.	Applicant(s)	
	09/891,876	KIUCHI ET AL.	
	Examiner	Art Unit	
	Huyen X Vo	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/25/2005*.

2. ☒ The allowed claim(s) is/are *1-18*.

3. ☒ The drawings filed on *26 June 2001* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Kader Gacem on 6/22/2005. The application has been amended as follows:

Claims 1, 8, 12, and 16 have been amended as follow:

1. A voice feature extraction device comprising:

a noise reduction system coefficient calculation unit that adds a gain-adjusted simulated voice signal to a surrounding signal, and calculates a noise reduction system coefficient of a noise reduction system based on the added signal and the gain-adjusted simulated voice signal delayed by a delay processing unit, and

an input voice power spectrum calculation unit that calculates a power spectrum vector of a power spectrum signal produced from an input voice signal,

wherein the noise reduction system that is set to the coefficient calculated by the noise reduction system coefficient calculation unit executes a noise reduction processing on the power spectrum vector.

8. A voice feature extraction device comprising:

a noise reduction system coefficient calculation unit that adds a gain-adjusted simulated voice signal to a surrounding signal, and calculates a noise reduction system

coefficient of a noise reduction system based on the added signal and the gain-adjusted simulated voice signal delayed by a delay processing unit, and

a microphone that collects an input voice signal of a user,

a window function operation unit that samples the voice signal inputted from the microphone, and prevents generation of high frequency components caused by a data jump at intervals of each frame,

an input voice signal power spectrum calculation unit that calculates a power spectrum vector of the input voice signal processed by the window function operation unit, and

a noise reduction system that is set to the coefficient calculated by the noise reduction system coefficient calculation unit, and executes a noise reduction processing on the power spectrum vector.

12. A method of extracting voice features comprising:

adding a gain-adjusted simulated voice signal to a surrounding signal;

calculating a noise reduction system coefficient of a noise reduction system to be used based on the added signal and the gain-adjusted simulated voice signal delayed by a delay processing unit, and

calculating a power spectrum vector of a power spectrum signal produced from an input voice signal,

wherein the noise reduction system that is set to the calculated noise reduction system coefficient executes a noise reduction processing on the power spectrum vector, and extracts the voice features.

16. A method of extracting voice features comprising:

adding a gain-adjusted simulated voice signal to a surrounding signal;

calculating a noise reduction system coefficient of a noise reduction system based on the added signal and the gain-adjusted simulated voice signal delayed by a delay processing unit, and

sampling a voice signal inputted from a microphone,

executing a processing to prevent generation of high frequency components of the input voice signal sampled,

calculating a power spectrum vector of a power spectrum signal produced from the input voice signal that is processed to prevent generation of high frequency components, and

calculating a voice feature from the power spectrum vector via the noise reduction system that is set to the calculated noise reduction system coefficient.

Allowable Subject Matter

2. Claims 1-18 are allowed over prior art of record. The following is an examiner's statement of reasons for allowance: Mokbel et al. (US 5905969) disclose a system for adaptive filtering of a digital telephone signal, in which the digital telephone signal is submitted to a frequency transformation and to a sub-band filtering in order to produce a plurality of sub-band signals. Each of the sub-band signals is submitted in turn to an adaptive filtering starting from a reference signal based on a long-term statistics regarding the telephone signal, equalization by blind deconvolution of the effects of the telephone transmission lines on the digital telephone signal thus being obtained (*referring to Mokbel et al. reference*). Im et al. (US 5805696) teach a device for providing conferencing communications, wherein the device comprises: a summing circuit for forming a signal sum equal to a sum of signals received from at least three information signal sources along with an echo compensation signal, the signal received from each information source including echoes and the signal sum including an aggregation of such echoes; an adaptive filter having an input and an output, the input being solely responsive to the signal sum and the output being only coupled to the

summing circuit, the filter forming the echo compensation signal which is an estimate of the aggregation of echoes; and a low level training sequence generator having an amplitude less than a predetermined level. The adaptive filter has coefficients whose respective values are varied in response to a training sequence comprising a plurality of a priori known values supplied by the low level training sequence generator and the predetermined level is below that of the signal received from the each information source (*referring to Im et al. reference*). Both Mokbel et al. and Im et al. fail to specifically disclose step adding a background noise signal to a gain-adjusted simulated voice signal, and calculates a noise reduction system coefficient of a noise reduction system based on the added signal and the gain-adjusted simulated voice signal delayed by a delay processing unit. Said calculated noise reduction system coefficient is then used by a second subsystem called the noise reduction system to process the input voice power spectrum to remove noise from said input voice power spectrum. Furthermore, it would have not been obvious to one of ordinary skill in the art at the time of invention to modify Mokbel et al. and/or Im et al. to obtain the claimed invention. Therefore, claims 1-18 are allowed over prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen X Vo whose telephone number is 571-272-7631. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HXV 6/22/2005

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SUSAN MCFADDEN
PRIMARY EXAMINER